Patent claims

1. Laminated safety glass, comprising
   - a first and a second pane of glass, and also,
   - arranged between the first and the second pane of glass, an intermediate layer, where the intermediate layer comprises:
     - from 50 to 80% by weight of PVB (partially acetalized polyvinyl alcohol)
     - from 20 to 50% by weight of a plasticizer mixture, comprising
       - from 30 to 70% by weight - calculated as proportion of the plasticizer mixture - of one or more polyalkylene glycols selected from the group consisting of
         - polyalkylene glycols of the general formula $HO-(R-O)_n-H$, where R = alkylene and $n > 5$,
         - block copolymers of ethylene glycol and propylene glycol having the general formula $HO-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-H$, where $n > 2$, $m > 3$, and $(n+m) < 25$,
         - derivatives of block copolymers of ethylene glycol and propylene glycol having the general formula $R_1O-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-H$ or $HO-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-R_1$, where $n > 2$, $m > 3$, and $(n+m) < 25$ and R_1 as organic radical,
         - derivatives of polyalkylene glycols of the general formula $R_1-O-(R_2-O)_n-H$, where R_2 = alkylene and $n \geq 2$, in which the hydrogen of one of the two terminal hydroxyl groups of the polyalkylene glycol has been replaced by an organic radical R_1,
         - derivatives of polyalkylene glycols of the general formula $R_1-O-(R_2-O)_n-R_3$, where R_2 = alkylene and $n > 5$, in which the

hydrogen of both terminal hydroxyl groups of the polyalkylene glycol has been replaced by an organic radical R_1 and, respectively, R_3.

2. Laminated safety glass according to claim 1, **characterized in that** the polyalkylene glycols have been selected from the group consisting of
- polyethylene glycol $HO-(CH_2-CH_2-O)_n-H$, where $8 < n < 25$,
- block copolymers of ethylene glycol and propylene glycol having the general formula $HO-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-H$, where $n > 3$, $m > 4$, and $(n+m) < 20$,
- derivatives of block copolymers of ethylene glycol and propylene glycol having the general formula $R_1O-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-H$ or $HO-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-R_1$, where $n > 3$, $m > 4$, and $(n+m) < 20$ and R_1 as organic radical,
- polybutylene glycol $HO-(CH_2-CH_2-CH_2-CH_2-O)_n-H$, where $4 < n < 18$,
- derivatives of the polyethylene glycol of the general formula $R_1-O-(CH_2-CH_2-O)_n-H$, where $n \geq 2$ and R_1 is an organic radical,
- derivatives of the polybutylene glycol of the general formula $R_1-O-(CH_2-CH_2-CH_2-CH_2-O)_n-H$, where $n \geq 2$ and R_1 is an organic radical.

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3. Laminated safety glass according to claim 1 or 2, **characterized in that** the proportion of the polyalkylene glycols in the total mixture for the intermediate layer is greater than 10% by weight and less than 25% by weight.

4. Laminated safety glass according to any of claims 1 to 3, **characterized in that** at least one plasticizer selected from the group consisting of
- esters of polybasic aliphatic or aromatic acids,

- polyhydric aliphatic or aromatic alcohols or oligoether glycols having not more than four ether units with one or more unbranched or branched aliphatic or aromatic substituents, e.g. dialkyl adipate, dialkyl sebacate, esters of di-, tri- or tetraglycols with linear or branched aliphatic carboxylic acids

is used as further plasticizer in the plasticizer mixture.

5. Laminated safety glass according to claim 4, **characterized in that** at least one plasticizer selected from the group consisting of di-n-hexyl adipate (DHA) and triethylene glycol bis-n-heptanoate (3G7) is used as further plasticizer at a proportion > 10% by weight of the total mixture.

6. Laminated safety glass according to any of claims 1 to 5, **characterized in that** a polyvinyl butyral having from 19 to 22% by weight of vinyl alcohol radical and from 0.5 to 2.5% by weight of acetate radical is used as resin.

7. Sound-insulation film for producing laminated safety glass, comprising:
- from 50 to 80% by weight of PVB (partially acetalized polyvinyl alcohol),
- from 20 to 50% by weight of a plasticizer mixture, comprising
  - from 30 to 70% by weight - calculated as proportion of the plasticizer mixture - of one or more polyalkylene glycols selected from the group consisting of
    - polyalkylene glycols of the general formula $HO-(R-O)_n-H$, where R = alkylene and n > 5,
    - block copolymers of ethylene glycol and propylene glycol having the general

formula $HO-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-H$, where $n > 2$, $m > 3$, and $(n+m) < 25$,

- derivatives of block copolymers of ethylene glycol and propylene glycol having the general formula $R_1O-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-H$ or $HO-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-R_1$, where $n > 2$, $m > 3$, and $(n+m) < 25$ and R_1 as organic radical,
- derivatives of polyalkylene glycols of the general formula $R_1-O-(R_2-O)_n-H$, where R_2 = alkylene and $n \geq 2$, in which the hydrogen of one of the two terminal hydroxyl groups of the polyalkylene glycol has been replaced by an organic radical R_1,
- derivatives of polyalkylene glycols of the general formula $R_1-O-(R_2-O)_n-R_3$, where R_2 = alkylene and $n > 5$, in which the hydrogen of both terminal hydroxyl groups of the polyalkylene glycol has been replaced by an organic radical R_1 and, respectively, R_3.

8. Use of one or more polyalkylene glycols selected from the group consisting of

- polyalkylene glycols of the general formula $HO-(R-O)_n-H$, where R = alkylene and $n > 5$,
- block copolymers of ethylene glycol and propylene glycol having the general formula $HO-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-H$, where $n > 2$, $m > 3$, and $(n+m) < 25$,
- derivatives of block copolymers of ethylene glycol and propylene glycol having the general formula $R_1O-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-H$ or $HO-(CH_2-CH_2-O)_n-(CH_2-CH(CH_3)-O)_m-R_1$, where $n > 2$, $m > 3$, and $(n+m) < 25$ and R_1 as organic radical,
- derivatives of polyalkylene glycols of the general formula $R_1-O-(R_2-O)_n-H$, where

R_2 = alkylene and $n \geq 2$, in which the hydrogen of one of the two terminal hydroxyl groups of the polyalkylene glycol has been replaced by an organic radical R_1,

- derivatives of polyalkylene glycols of the general formula $R_1\text{-}O\text{-}(R_2\text{-}O)_n\text{-}R_3$, where R_2 = alkylene and $n > 5$, in which the hydrogen of both terminal hydroxyl groups of the polyalkylene glycol has been replaced by an organic radical R_1 and, respectively, R_3,

as an additive improving sound insulation in films produced from plasticized PVB resin for laminated safety glass, where the sound insulation of the laminated safety glass is increased by the addition of the polyalkylene glycols by at least 2 dB, measured to DIN EN ISO 717, in the coincidence frequency region from 1000 to 3500 Hz.